towards the middle of the Belt. From 9 a clock 5 minutes and 40 ſeconds, untill 9 a clock and 8 minutes, they ſaw it in the midſt of the Belt. At 9 a clock and 15 minutes it was paſſed the middle, and was come nearer to the Occidental limb. And a little after the Heavens being over caſt, he could then obſerve it no further.

This Obſervation being taken for the *Epocha*, it is eaſie to find hereafter the times, when this Spot ſhall return to the midſt of the Belt. For you are only to add alwaies 9 hours and 56 minutes, and, for greater preciſenes's ſake, not to omit the ordinary Equation of days, that depends from the inequality of the motion of the Sun in reſpect of the Equinoctial, nor the particular Equation, that depends from the inequality of the motion of *Jupiter* according to the diverſity of the diſtance of the Sun and his Apogee.

This Revolution being the ſwifteſt and the moſt regular that is hitherto known in the Heavens, a Travellour alone, even without having any correſpondence with other Obſervers, may make uſe of it to find the *Longitudes* of the moſt remote places of the Earth. We ſhall hereafter examine, to what preciſeneſs we may arrive by this way.

Obſervations of a New Comet, *made at* Paris *in the Royal Obſervatory by Signor* Caſſini.

THere now appears a Comet, which ſeems to be near the end of his Appearance, and which might have been ſeen above a month ſince, if the weather had been favourable. But he being very ſmall, and having been a long while obſerved by the beams of the Sun, to which he was nigh, and afterwards by the Moon, which was greatly advanced in her light, beſides that the Heavens in theſe parts have often been over-caſt, we have not obſerved him but lately.

The Mathematicians of *la Fleſche* perceived him from the 16 of March, and gave us here at *Paris* the firſt notice of it. Thoſe of the College of *Clermont* being advertiſed of it, ſaw him the 25*th* of the ſame month. And upon notice given of it to the *R. Academy of the Sciences* by *P. Pardies*, Profeſſor of the Mathematicks in the College of *Clermont*, Signor *Caſſini* hath ever ſince been obſerving him as much as the weather did permit

March

March 26.h.7½. in the evening, he ſaw him between the Head of *Meduſa* and the *Pleiades*; without a Teleſcope he appeared no otherwiſe than a Star of the third magnitude. He appeared bigger by Teleſcopes, and ſurpaſſed much the Stars of the firſt magnitude; but he was very dark, as if it had been nothing but a ſmall whitiſh cloud, and we could hardly perceive him, when we held a light to the threds of our Teleſcopes applied to the inſtruments, inſtead of *Sights*, for to obſerve with greater preciſeneſs.

His *Head*, ſeen with a Teleſcope of 17 foot, appeared almoſt round; but it was well defined, and diſtinguiſh't from the miſtineſs, which formed a kind of chevelure, wherewith it was encompaſſed; and even the middle was a little confuſed, and ſeemed to have inequalities, as are ſeen in clouds.

The *Tayl*, which is principally that which diſtinguiſheth Comets from Stars, was almoſt imperceptible; yet by the Teleſcope it was ſeen turned oppoſite to the Sun, and it appeared of the length of two diameters of the Head or thereabout: For it was not eaſie, to meaſure it preciſely, becauſe being thinner according as it was farther from the Head, its extremity was inſenſibly loſt. And ſo the whole Comet, Head, Tail, and Chevelure taken altogether, took up no more than 3 or 4 minutes of a degree.

H. 7. 48'. he was in a ſtreight line with the *Lucida* in the Head of *Meduſe*, and with the moſt Occidental one of the *Pleiades*; and above the two cleareſt Stars of the Southern foot of *Perſeus*; ſo that a ſtreight line, drawn through theſe two Stars, did almoſt touch the Southern extremity of his Chevelure. This place of the Comet, transferred upon the Map of the Fixt Stars, fell preciſely enough upon 23°.25'. of the ſign of *Taurus*, in 14 degrees of Northern Latitude. Mean time, we were fain to content our ſelves with determining after this manner the place of the Comet, becauſe of the difficulty we found to ſee him by the Inſtruments, when the light was held to them, as was ſaid above.

With a Teleſcope of 3 foot, we ſaw near the Comet two ſmall Stars, diſtant one diameter of the Sun from one another, which ſtars are not in the Catalogues. The Comet was in a manner between thoſe two ſtars, and little by little he approached to the ſtreight line, drawn from the one to the other. Signor *Caſſini* waited the time of its being preciſely in this ſtreight line; which hapned at h.9.15': and then he found, that he was not exactly in the midſt of theſe two ſtars, and that his center was a little nigher to that, which was weſt-ward: But h.9. 33'. he was equally diſtant from them.

them both. This Obſervation was made on purpoſe to know the *parallax* of the Comet, if happily ſome other Obſerver ſhall have obſerved him in a remote Country: whence it may be judged, how far he was diſtant from the Earth. It was taken notice of, that from h.8.5″. of the evening, until h.10. 26′. he made, in reſpect of theſe two ſtars, an oblique motion ſenſible enough, going from North to South in the ſame time that he advanced from Weſt to Eaſt.

Beſides theſe two Stars, there were on the North of the Comet three other ſmall ones, equally diſtant from one another, and placed in a ſtreight line; and Weſt-ward we ſaw a fourth beneath the Head of the Comet, from which ſhe was diſtant about two diameters of the Comet. Theſe 4 laſt Stars were ſo ſmall, that we could not ſee them, even with a three foot Teleſcope; but we eaſily diſtinguiſh't them with one of 17 feet.

The Clouds hid the Comet about h.10. at night, and they alſo kept us from ſeeing him the next night of March 27.

March 28. h. 7. 42′. in the evening the Comet was diſtant from the leſs bright ſtar of the Southern foot of *Perſeus*, no more than about 24′. weſtward. He had almoſt the ſame Latitude with this Star; ſo that he was preciſely enough at 26.deg. 8′. of the ſign of *Taurus*, and in the latit. of 12 deg. 8′. We tryed to take the diſtance of the Comet to the moſt remote fixt ſtars; but we found great difficulty in it: for we ſaw the Comet not diſtinctly enough by the Teleſcopes applied to the Inſtruments, when we held a light to the threds; and beſides, there was a very rough wind, which did exceedingly diſcommode the Obſervers.

Yet notwithſtanding, h.8. 14′. we took, as well as we could, the diſtance of the Comet to the Star in the Eye of *Taurus* called *Aldebaran*, and we found, that this diſtance was of 19. deg. 38′: And h. 8. 29′. the diſtance of the Comet to the Star, called *Capella*, was found to be of 22. deg. 32′. When we were preparing our ſelves to verifie theſe diſtances, the clouds covering the heavens interrupted the obſervation.

The ſame evening, when we beheld the Comet with Teleſcopes, we ſaw about his head a chevelure of an almoſt equal length, without being able clearly to diſtinguiſh his tail oppoſite to the Sun. 'Tis true, that the Air was not clear enough, and even at the place of the Comet there were ſome ſmall clouds.

March 29. we could not obſerve, becauſe the Sky was wholly over-caſt.

March 30.h.9.35'.at night,the Comet ſeen without a Teleſcope appeared no otherwiſe than a Star of the 4th magnitude: through the Teleſcope he exceeded even thoſe of the firſt;but he was very dark,and in what manner ſoever we looked upon him, we could obſerve almoſt no tayl at all of him. He had paſſed one degree and an half beneath the *Lucida* of the Southern foot of *Perſeus* ; ſo that this ſtar was exactly in the midſt of the Comet and the little ſtar of the leg of *Perſeus*,marked η by *Bayerus*, which then we ſaw not but by a Teleſcope. A ſtreight line, drawn from one of theſe ſtars to the other,did almoſt touch the Southern limb of the Comet,which being tranſferred upon the Map of the Fixt Stars, fell upon 28 deg. and 45'. of *Taurus*,in the Northern latit. of 9. deg. 56'.

H. 9. 45'. Signor *Caſſini* compared the Comet with the leſs bright Star of the Southern foot of *Perſeus*,near which he had been *March* 28 ; and he found , that the Weſtern limb of the Comet touched a ſtreight line,drawn through this leſs bright ſtar of *Perſeus*'s Southern foot, and through the moſt Northern of the Head of *Taurus*; but that he was already got ſomewhat nearer to the latter. This made him judge,that the Comet, which had left,on the North-ſide,all the Stars of the Southern foot of *Perſeus*, would in the progreſs of his courſe leave, on the South-ſide,all the moſt Northern ſtars of the head of *Taurus*.

March 31. h. 8 in the evening, the Comet was in a direct line with the *Lucida* in the foot of *Perſeus*,and with the moſt Northern in the Head of *Taurus* ; but he was more than twice as much remoter from the firſt than the other,and being tranſferred upon the Map of the fixt ſtars,he was found at 15 minutes from *Gemini*, in the latit. of 8 deg. 49'. During the whole time that we could obſerve him this night, (which was till 10 a clock,) he quitted not this ſtreight line, which was almoſt parallel to the horizon: notwithſtanding that his own particular motion ſhould raiſe him a little above it ; as the parallax,on the contrary,ſhould ſink him beneath it in approaching to the horizon. It may be,there was a compenſation made of theſe two contrary motions : poſſibly alſo the effect of both was not ſenſible ; which ought to be examined. If it be found,that in ſome remote quarters the ſame obſervation have been made, the *parallax* will be determined by comparing the Obſervations.

April 1. the Comet could not be ſeen without a Teleſcope, becauſe the Moon,being very near it, hid him from our ſight. But

with

with a Teleſcope only of one foot we diſcerned him eaſily enough, and found, that he had paſſed 45′. minutes beyond the moſt Northern ſtar of the Head of *Taurus*, and that he muſt have touch't it by his Southern limb; as alſo that he was diſtant one degree and 43′. from the Star that was neareſt to that toward the South. This place being transferred upon the Map of the fixt ſtars, we found, that he was at 1. deg. and 30′. of *Gemini*, in the Northern Latit. of 7 deg. 44′.

Signor *Caſſini*, having conſidered theſe two ſtars, obſerved, *that* the ſecond is not leſs bright than the firſt; and yet that *Bayerus* hath not marked it, who hath made an exact enumeration of the Stars that may eaſily be ſeen with the naked eye; and *that* at firſt ſight it ſeems, that *Tycho* hath left it out in his Catalogue. For he puts 4 ſtars in the place he calls *in quadrilatero cervicis*, and he ſpeaks not of this which is the 5th, and maketh with the other four an irregular pentagone. 'Tis true, that beſides theſe 4 ſtars, after he hath marked 13 others of them, he puts yet one by it ſelf for the laſt, which he calls *in quadrilatero colli præcedens*; as if, beſides the firſt quadrilateral, there were yet another in the Neck of *Taurus*. Mean time there is in this place but 5 ſtars of the 5th magnitude, which make not a quadrilateral figure; but a pentagone, as I was juſt now ſaying.

This omiſſion of *Bayerus*, and the denomination, which *Tycho* uſeth to denote theſe Stars, which ſuits not with the number nor the configuration that now appears, do adminiſter cauſe to doubt, whether the Star in queſtion be not one of thoſe that appear from time to time; as there are two in the conſtellation of the *Swan*, and another in the neck of the *Whale*. We ſhall particularly take heed of this place of the Heavens, to clear up this doubt.

April 2. h. 8. in the even, Signor *Caſſini*, having obſerved the Comet with a Teleſcope of one foot, which diſcovered 5 degrees, found, that he was two degrees and an half diſtant from the moſt Northern ſtar of *Taurus*; and one degree from the ſtar of the Ear, marked φ by *Bayerus*, and by *Tycho* called *ſequentis lateris Borea*.

Two lines drawn from the moſt Northern ſtar of *Taurus*, one to the Comet, the other to the Star that is wanting in *Bayerus*, made a right angle; and the diſtance of the Comet to this angle was double to that, which is between theſe two Stars. This place transferred upon the Map of the fixed Stars, fell on 2 degrees and 48′. of *Gemini*, in the Northern latit. of 6. deg. and 40′.

H.6.50'.The line drawn through the horns of the Moon paſs'd through the Star, that is at the point of the Northern horn of *Taurus*,and the diſtance of this Star to the Northren horn of the ☽ was by a Minut greater than the Semi-diameter of the Moon.

April.3.The Sky was ſo cover'd,that we deſpair'd to obſerve the Comet that night: yet notwithſtanding the Clouds being ſomewhat diſpelled h. 9. we ſaw him with one foot Teleſcope. He had paſſed over the upper Star of the Ear of *Taurus*,and he made with this Star the *baſis* of an *Iſoſceles* triangle,on the top whereof was the inferiour Star of the Ear. The two ſides of this Triangle were two times and an half bigger than the *baſis*; ſo that the Comet was at four degrees from the ſign of *Gemini*,in the Northern Latit. of 5 degr.and 38'.The clouds being almoſt preſently return'd,we could obſerve no further.

April 4. The Heaven was conſtantly cover'd, ſo that we could make no Obſervation at all.

April.5.h.8. at even,the Comet had paſs'd the Northern Ear of *Taurus*, and was equally diſtant from the upper Star of the Northern Ear,and from that which was on the front of *Taurus*. He was alſo as diſtant from the inferior Star of the Ear of *Taurus*, as this Star is from the next Weſt-ward,by Tycho call'd *inferior præcedentis lateris quadrilateri*;and a ſtreight line,drawn through the Comet and the upper Star of the Ear, made an almoſt right angle with an other line,drawn from the Comet to the inferior of the two ſmall ſtars, that are above the Eye of *Taurus*. This place being carried over to the Map of the fixt ſtars,the Comet was found at 6.deg.18'. of the ſign of *Gemini*, in the Northern latit.of 3. deg.41'.He was ſo confuſed this night,that even with the 17 foot Teleſcope we could not exactly diſtinguiſh the Head from the Chevelure,which environed him. The whole appear'd a little bigger than the diſque of *Jupiter*, ſeen by the ſame Teleſcope.

Apr. 6. h. 8. at even, a ſtreight line drawn from the Comet to the ſtar that is in the front of *Taurus*,made a right angle with an other ſtreight line drawn from this ſame ſtar to the inferiour of the two that are above the Eye:And the diſtance of this later ſtar to that of *Taurus* was twice the diſtance of the ſame ſtar of the front of *Taurus* to the Comet. This place being transferr'd upon the Map of the fixt ſtars, the Comet was found at 7. deg. 25' of *Gemini*,in the Northern latit. of 2.deg.45'. H.9.6'. we ſaw on the ſide of the Comet a ſtar ſufficiently clear,which was not further diſtant from him, than a little more than the diameter of the Comet, and that was at the ſame height of the Horizon: which may ſerve to determine the *parallax*,if the ſame obſervation be made elſwhere.

April.7.h.9. in the evening, the Comet was equally diſtant from the inferior ſtar of the Northern Ear of *Taurus*, and from the ſuperior of the root of the Northern horn. He was alſo as far diſtant from this latter ſtar, as this ſtar is from that of the front.This place,being carried over to the Map of the fixt ſtars, fell on 8.degrees and 30′. of *Gemini*, in the Northren latit.of 1. degree and 56′.As we were preparing to obſerve with the great Teleſcope,the Heaven was clouded over.

April. 8.9.and 10. we could make no obſervation at all, becauſe of the conſtant dark weather.

Signor Caſſini's *reflections on the foregoing Obſervations.*

All the places of the Comet,that we have obſerved till now, fall into a line little differing from an Arch of a great Circle,which cuts the Ecliptique in the 10*th*. deg.45′.of *Gemini*, and which conſequently hath its greateſt latitude in the 10*th*.degree and45′. of *Piſces*; which latitude is between 39. and 40. deg. Nord-ward. The ſame Circle cuts the *Equator* at 101.degrees of the Vernal Section Eaſt-ward, and its greateſt declination from the *Equator* Nord-ward is of 38½ degrees.

Whence it follows, that the Comet at the time of his greateſt Declination,wherein it may have ſtay'd a conſiderable time, hath touch'd the horizon of thoſe that are in the latitude of 51½ degrees;the parallel of whom paſſeth through the lower part of *England*,and through *Zealand*,*Weſtphalia*,*Saxony*,*Poland* &c:And that he hath remain'd at that time all night and all day above the horizon of the moſt Northern people; as are thoſe of the upper part of *England*,*Holland*,*Pomerania*, &c. But that he hath paſs'd through the Zenith of the lower part of *Spain*,and through *Sardinia*,*Calabria*,*Chio*,*Smyrna*,&c;yet without having been perceived in thoſe places, becauſe he there paſs'd in the day-time.

Since we could not ſee this Comet but about the end of *March*, we have made uſe of our method explained in the Theory of the Comet of the year 1665. to find the places whereabout this Comet hath been during the moneth of *March*, in the Hypotheſis of the equal rectilineal motion,which ſerveth to repreſent the places of Comets for ſome time of their apparition, but not for the whole time: as we have ſhew'd in that Theory.

Having therefore choſen two of our firſt Obſervations, (becauſe the latter are not ſo proper for this purpoſe,) and having taken a Mean between the firſt Obſervations of the Mathematicians of *la Fleſche*, we have found by this method, that the Comet had been in his Perigee the 12*th.* of *March* at 8 a clock in the morning: *that* in that time, which is that of his greateſt apparent celerity, he made about 2. deg. 32'. a day in the great Circle of his *apparent* motion, and $\frac{444}{1000}$. of his perigee-diſtance in the line of his *equal* motion: *that* he was in his greateſt Declination the 11*th.* and 12*th.* of March; and *that* at that time he paſs'd through the inferiour Meridian at about two a clock after midnight. Wherefore, if the weather hath been favourable, he muſt have been obſerv'd by Mr. *Hevelius*, who hath ſeen him, witneſs his Letter, from the 6*th.* of *March*; * at which time he was in perigee and made the biggeſt ſhew.

* *See* No. 81. p. 4017.

If we have rightly determin'd his Perigee, and that the *hypotheſis* of the equality of his motion be juſt for that time, nor he hath begun to appear but when he was ſufficiently nigh to the Earth; then he hath been viſible ſince the middle of *February*, at which time he was as far diſtant from his perigee by approaching to the Earth, as he is at the preſent by receding from it. He muſt then have been at the extremity of the Southern wing of the *Swan*, and arriv'd at the Southern foot of *Pegaſus* on the 23*th.* of *February*, of the ſame bigneſs that he was ſeen to be of, *March* 28. He muſt have arrived at the Stars of the Northern Arm of *Andromeda*, *March the 9th*; at thoſe of her *Girdle*, the 12*th.* when he was in his Perigee, and in his greateſt declination; to her Southern Legg, *March* 15*th*; between her Southern Legg and the Triangle, *March* 18*th.* very near as he was obſerv'd at *la Fleſche*; and under the head of *Meduſa*, *March* 25*th.* The dayes enſuing he muſt have arriv'd at the places marked in our firſt Obſervations: But in the laſt, he hath been ſwifter than this *Hypotheſis* will bear. To repreſent theſe latter Obſervations, the Line of the motion ought to have been made curve, as we did for the end of the apparent motion of the Comet of 1665, with this difference, that inſtead of *that* lines being convex in regard of the Earth, becauſe the motion was retrograde, *this* was to be made Concave towards the Earth; ſuitable to what hath been ſaid in the ſame Theory, becauſe that the motion of this Comet is direct.

According to this *Hypotheſis*, thoſe laſt daies, that the Clouds hindred us from ſeeing this Comet, he muſt have continued his courſe towards the root of the Southern horn of *Taurus*, and having paſs'd the Ecliptique between the *9th* and *10th* of *April*, he muſt paſs on the top of *Orion's* head the 20*th*; over his Arm the 24*th*; and at the end of this month he will be in the *Milky Way*. But it will be difficult hence forward to find him, becauſe of his ſmallneſs, and the light of the Moon.

Tis a thing worth obſerving, that this Comet keeps his courſe almoſt like that of the 2*d* Comet of 1665, and of another of 1577 obſerv'd by *Tycho*. For they have paſs'd through almoſt the ſame Conſtellations; though this be more inclined Nord-ward, and cut the Ecliptique five or ſix degrees more forward than that of 1665. So that it ſeems, that in this place of the Heavens there is, as 'twere, a *Zodiaque* for Comets.

An Account of ſome Books.

I. *De* ***RESISTENTIA SOLIDORVM*** Alexan. Marchetti, *in Piſana Academia Phil. Prof. Excuſum* Florentiæ 1665 *in thin* 4°.

THis book came not long ſince to my hands: It had been promiſed ſome years before under the Title of *Galilæus ampliatus*. But the Author now follows not the Steps of *Galilæus*, but demonſtrates all his Propoſitions another way; building all upon this ground: *Momenta Gravium proportionem habent compoſitam ex proportionibus ponderum & longitudinum*: which is his firſt Proportion. This Book being but ſmall, and the ſubject admitting of enlargement, the Author promiſeth a larger Treatiſe of the ſame.

II. *Tabula numerorum QVADRATORVM decies millium, unà cum ipſorum* LATERIBVS *ab Vnitate incipientibus, & ordine naturali uſque ad* 10000. *progredientibus*. Londini, 1672.

A Table of ten thouſand *Square numbers*, namely of all the Square Numbers between 0 and 100 milions; and of their *Sides* or *Roots*: Which are all the whole Numbers between 0 and ten thouſand: 8 ſheets in fol.

The Concinnity of 10, 8 or 7. Centuries in each opening, may ſo pleaſe ſome Reader's eye as to invite him to continue the

Table